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ABSTRACT

This study compared both physical education "Type A" (activity) space and ancillary space at the Big Ten Universities with the physical education space guidelines established in 1967 by the National Facilities Conference and the assigned guidelines for the seven ancillary space types. The data were obtained through the use of a questionnaire, interviews, and room inventories and schematics. The universities failed to meet the recommended guideline of 12 square feet per assigned student population (ASP) for "A" space and, in general, exceeded the recommended guidelines of 35 percent for ancillary space. The percentage breakdown of the seven ancillary space types varied according to whether or not all the athletic facilities were included in the analysis. Based on the results of this study, new space guidelines were suggested. (JD)

A Space Analysis of Physical Education Activity and Ancillary Areas in Big Ten Universities

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Running head: FACILITY STANDARDS

A Space Analysis of Physical Education Activity and Ancillary Areas in Big Ten Universities

Planning adequate physical education facilities has long been a task of great complexity. For many years physical education programs have been affected by inadequate facilities. In recent years, the scope of physical education, which traditionally included teacher preparation, activity, health and recreation, has greatly expanded and become increasingly diversified. This diversification and expansion has resulted in an increase in various sub-specializations within the profession of physical education. In order for institutions of higher education to efficiently and functionallly maintain and improve the various programs, adequate activity and ancillary space is mandatory.

In 1959, as part of a master plan for the University of Illinois, the College of Physical Education at the University of Illinois was asked to help plan physical education and intramural facilities. At the time no standards were available that could serve as guidelines. Visits to each of the Big Ten Universities and several institutions of similiar enrollment outside the Big Ten conference enabled Sapora and Kenney (1961) to establish a standard for square feet needed per student for physical education, intramural, and athletic facilities for colleges and universities.

Sapora and Kenney (cited in Kenney, 1961) recommended that for Type A - Indoor Teaching Stations a minimum of 8.5 - 9.5 square feet per

student (total undergraduate enrollment) was needed. They also determined that the space needed for lockers, showers, toweling rooms, equipment storage, supply rooms, and offices (known as ancillary space or space associated with "A" space) should be a square footage which equaled approximately 40 percent of the play or activity area in a gymnasium facility.

The Fourth National Facilities Conference, held at Indiana University in 1967, consisted of recognized leaders who had been carefully selected based on knowledge and contributions within their fields. These professionals recommended that the 8.5 - 9.5 square feet per student be expanded to 12 square feet per student (ASP - assigned student population) of indoor activity space in institutions with a minimum enrollment of 3000 students or above (National Facilities Conference, 1968). It was also recommended that ancillary space should be a square footage equaling approximately 35 percent of Type "A" space in a facility.

In a study conducted to determine the effectiveness of indoor activity space at a university, Strauss (1969) discovered that the existing square footage of seven square feet per student was inadequate. He suggested, without scientific basis, that in order to provide adequate facilities, at least nine square feet per student was needed. He also discovered that ancillary space represented 26 percent of the recommended total amount of "A" space. However, he did not include classrooms in his analysis.

Two studies conducted in 1972 and two studies conducted in 1980 investigated the extent to which colleges and universities provided indoor activity space for physical education and recreation. Heine (1972) reported a sample mean of 9.67 square feet per assigned student population and Daniels (1972) reported a mean of 11.9 square feet per student of indoor activity space in resident institutions and a mean of seven square feet per student in non-resident institutions. White (1980) reported that a majority of Big Ten Universities did not meet the space quidelines as recommended in 1967. His findings revealed a mean "A" space of 4.78 square feet per ASP, which was significantly less than the recommended guideline of 12 square feet. Kadatz (1980) reported that 50 percent of the Canadian universities in his study provided at least 8.5 square feet of activity space per student and that close to 100 percent of the institutions provided ancillary space amounting to at least 40 percent of the activity space.

The most recent edition of Planning Facilities for Athletics, Physical Education, and Recreation (The Athletic Institute, 1985) maintains the space guideline of 8.5 - 9.5 square feet for Type "A" space and 40 percent of Type "A" space for ancillary space as established in 1961.

This study replicated the 1961 study of Sapora and Kenney for the purpose of readjusting space guidelines for Type "A" space and ancillary space. Additionally, ancillary space was divided into seven categories and space guidelines were suggested for those categories.

Methods

SUBJECTS

Nine universities belonging to the Big Ten Conference served as the subjects for this investigation. The institutions were selected because they had been used in the initial physical education space standards study done by Sapora and Kenney, they all had undergraduate and graduate programs in physical education, and the institutions of the Big Ten Conference are generally considered to be among the best in the county in terms of facilities and academic programs. One Big Ten University was omitted because it did not have a physical education program.

PROCEDURES

The procedures were organized to determine if Type "A" space and ancillary space standards as recommended by the National Facilities Conference in 1967 were being followed in the Big Ten Universities and to assign guidelines for the seven ancillary space types based upon the results of ancillary measurements in the Big Ten Universities.

Sapora and Kenney conducted the initial study on space standards for physical education facilities in 1961. Their concept for developing space standards, from which the present standards evolved, has been widely accepted for college and university physical education facilities by the American Association for Health, Physical Education, Recreation, and Dance. It was determined to use procedures similiar to those used by Sapora and Kenney.

Initial data on the facilites were obtained through the use of a questionnaire which was similiar to those used by Heine (1972), Daniels (1972) and White (1980). Questionnaire data was supplemented by interviews with Physical Education Chairmen, Facilities Directors, staff members and graduate students during a one day visit to each institution. To determine total square footage of Type "A" activity space and total square footage of ancillary space, room inventories and schmatics which contained square footage measurements of physical education, recreation, and athletic activity areas and ancillary areas were obtained from the Office of Space Management at each university.

Results

After all the data had been collected and analyzed, and the visitations and interviews completed, it became apparent that most institutions could not and did separate their physical education, recreation, and athletic facilites with clear divisions. Due to commonality within the physical education, recreation, and athletic programs, it appeared virtually impossible to separate all spaces within a building in terms of being used only for physical education, recreation, or athletics.

The results reflect two separate analyses. Facilities included in the first analysis consisted of all the physical education and recreation facilities, and specific athletic facilities which were jointly used by the physical education, recreation, and/or athletic

programs (JOINT). Facilities included in the second analysis consisted of all physical education, recreation, and athletic facilities (ALL).

The mean indoor activity space provided in JOINT facilities was found to be 7.11 square feet per ASP. This was a significant difference from the 12 square feet per ASP as recommended by the 1967 National Facilities Conference (Table 1). The mean ancillary space was found to be 38.11 percent. Although the ancillary mean exceeded the 1967 guideline there was no significant difference from the 35 percent as recommended by the 1967 National Facilities Conference (Table 2).

Insert Table 1 about here

Insert Table 2 about here

The mean indoor activity space provided in ALL facilitiees was found to be 9.54 square feet per ASP. This was a significant difference from the 12 square feet per ASP as recommended by the 1967 National Facilities Conference (Table 1). The mean ancillary space was found to be 55.52 percent. This was a significant difference from the 35 percent as recommended by the 1967 National Facilities Conference (Table 2).

Table 3 provides a comparison of the percentages that each ancillary component received. A comparison of the ancillary component

percentages revealed similar percentages for Type II, Type III, and Type IV with all having less than 0.05 percentage point difference.

Insert Table 3 about here

Discussion

At all the Big Ten Universities included in this study, indoor activity space increased as a result of sharing facilities with the intercollegiate athletic programs. The analyses indicated that the universities tended not to meet the 1967 recommended guideline for activity space whether JOINT or ALL facilities were included; however, ALL facilities provided an average of two square feet more per ASP. When compared to the 1961 Sapora and Kenney guidelines of 8.5-9.5 square feet, no significant difference was found between either the guideline and JOINT or ALL facilities.

The amount of space provided for indoor activity space may have been influenced by the quality of the physical education programs offered at the Big Ten Universities. Many universities are changing the scope of their physical education programs and moving toward research in physical education while reducing their teacher preparation programs and their basic activity programs. Since this is the case, the space provided for indoor activity may have met the needs of the specific programs but not the recommended 1967 guideline. However, this was not the case. Individuals at every institutions felt that their activity

space was inadequate, and in fact, every institution had recently built or was in the process of planning and/or constructing additional facilities.

These findings corroborate those of previous facility space studies (Kadatz, 1980; White, 1980; Daniels, 1972; Heine, 1972; and Strauss, 1969). With this knowledge, it is reasonable to assume that the 1969 recommended guideline of 12 square feet per ASP is not valid and needs to be adjusted. In fact, the 1961 Sapora and Kenney guideline appears more appropriate.

Since a majority of the Big Ten Universities met the 1967 recommended guideline for ancillary space, it could be assumed that ancillary space should be at least 35 percent of the total "A" space. For JOINT facilities six of the universities exceeded 35 percent with two of these exceeding 40 percent, while for ALL facilities, every university exceeded 40 percent. In fact, ancillary space increased approximately 17 percent when the space analysis included ALL facilities. This corroborates the findings of Kadatz (1980).

Although the ancillary space percentage exceeded the 1967 recommended guideline, a majority of the individuals questioned stated that they felt they did not have enough ancillary space. This may have been due to the fact that the nature of physical education is changing and more institutions are doing research and related research activities which require laboratories, offices, classrooms, and storage. The

greatest ancillary needs were reported to be laboratories, classrooms, and offices.

As reported in Table 3 percentages for the seven ancillary components were determined. Although similar percentages of Type II, III, and IV space were reported for both JOINT and ALL facilities, differences were reported for Types I, V, VI, and VII. These differences many be due to the following: (a) locker facilities can be used by either males or females, by either varsity athletes or physical education students; (b) because it is time consuming and expensive to move equipment, storage space is needed near every place in which activity occurs; (c) very little research is none in athletic facilities; and (d) there is a limited demand for training rooms in physial education facilities.

In summary, present Big Ten University physical education, recreation and athletic facilities fail to meet the 1967 "A" space guideline of 12 square feet per ASP whether measured JOINT or ALL; however, they tend to exceed the ancillary guideline of 35 percent; individuals at every university believe they need additional "A" space and ancillary space; and the percentage for the seven ancillary components differs for JOINT and ALL facilities.

Based on the findings of this study the STRAND SPACE GUIDELINES OF 1988 FOR PHYSICAL EDUCATION FACILITIES are recommended for utilization of space guidelines in the planning and construction of physical education facilities.

STRAND SPACE GUIDELINES OF 1988 FOR PHYSICAL EDUCATION FACILITIES

ACTIVITY SPACE: Indoor activity space used for physical education instruction, intramural sports, physical recreation, and varsity athletics.

Space Requirements:

1. Nine (9) square feet per student if considering JOINTLY used physical education, recreation and athletic facilities.

2. Twelve (12) square feet per student if considering ALL physical education, recreation and athletic facilities.

* Breakdown of Activity Space:

A1 - Large gymnasium areas with high ceiling (22 feet minimum) for basketball, badminton, gymnastics, volleyball, etc. (Approximately 55 percent of the computed activity space).

A2 - Activity areas with relatively low ceilings (12 feet minimum) for combatives, dancing, weight training (Approximately 30 percent of the computed activity space).

A3 - Swimming and diving pools (Approximately 15 percent of the computed activity space).

ANCILLARY SPACE: Indoor service space which provides services for physical education, health, recreation, leisure service and athletic programs.

Space Requirements:

1. A square footage equaling approximately 40-45 percent of the total activity space if considering JOINTLY used physical education, recreation and athletic facilities.

2. A square footage equaling approximately 55-60 percent of the total activity space if considering ALL the physical education, recreation and athletic facilities.

STRAND SPACE GUIDELINES (cont.)

Breakdown of Ancillary Space:

Depending upon a university's physical education, recreation and health curriculum; the amount and types of facilities jointly used among physical education, recreation and athletics or whether the amount and types of facilities includes all the athletic facilities; and the amount of research being conducted, the following range of guidelines are recommended. When all the athletic facilities are included in a space analysis, the percentage of Type I and Type VI space should be toward the lower percentage and the percentage of Type V and Type VII space should be toward the higher percentage. This should be inversed if only the jointly used athletic facilities are included in a space analysis.

Type I - Locker rooms, shower rooms and dressing rooms (App. 35-40 percent of the total ancillary space).

Type II - Classrooms, seminar rooms and conference rooms (App. 5-10 percent of the total ancillary space).

Type III - Faculty, part-time faculty and graduate offices (App. 15-20 percent of the total ancillary space).

Type IV - Secretarial work space and reception space (App. 5-10 percent of the total ancillary space).

Type V - Storage rooms, supply rooms, equipment rooms and laundry (App. 20-30 percent of the total ancillary space).

Type VI - Laboratories, research rooms, library and computer rooms (App. 5-15 percent of the total ancillary space).

Type VII - Training rooms (App. 1-5 percent of the total ancillary space).

* ENROLLMENT:

A college or university with an enrollment of fewer than 3000 undergraduate students should meet the minimum physical education - recreation space needs of an institution of 3000.

* Retained from 1967 National Facilities Conference

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TABLE 1

A COMPARISON OF INDOOR ACTIVITY SPACE

AND THE RECOMMENDED 1967 GUIDELINE

	Variable	Recommended Guideline	Population Mean	Standard Deviation	t
1.	A Space	12 Sq. Ft.	7.11 Sq. Ft.	2.44	-6.00*
2.	A Space	12 Sq. Ft.	9.56 Sq. Ft.	2.23	-3.30*

* $p \leq 2.30$

1. Physical Education, Recreation, Jointly used Athletic Facilities compared against the 1967 Guideline.
2. Physical Education, Recreation, All Athletic Facilities compared against the 1967 Guideline.

TABLE 2

A COMPARISON OF ANCILLARY SPACE

AND THE RECOMMENDED 1967 GUIDELINE

	Variable	Recommended Guideline	Population Mean	Standard Deviation	t
1.	Ancillary	35%	38.11%	0.102	0.94
2.	Ancillary	35%	55.52%	0.148	4.14*

* $p \leq 2.30$

1. Physical Education, Recreation, Jointly used Athletic Facilities compared against the 1967 Guideline.
2. Physical Education, Recreation, All Athletic Facilities compared against the 1967 Guideline.

TABLE 3

ANCILLARY PERCENTAGE BREAKDOWN FOR TWO SPACE ANALYSES

Ancillary Component	Physical Education Recreation Jointly Used Athletic Facilities	Physical Education Recreation All Athletic Facilities
Type I (Lockers)	39.03 percent	32.76 percent
Type II (Classrooms)	5.05 percent	5.31 percent
Type III (Offices)	17.23 percent	16.74 percent
Type IV (Secretarial)	5.36 percent	5.53 percent
Type V (Storage)	21.11 percent	28.75 percent
Type VI (Laboratories)	10.55 percent	6.25 percent
Type VII (Training Rooms)	1.31 percent	4.27 percent